



RHIZOFORM LLC

Product Description

Rhizoform, LLC provides a cost-competitive bioengineering technology to manufacture rapidly-renewable thermal insulation. Our product is a carbon-neutral, green, and cost-competitive alternative to synthetic insulation. It provides an innovative and cost-effective approach to revolutionizing thermal insulation. Our insulation guards your investment into building or infrastructure from the climate extremes while protecting the environment.



Sample of Rhizoform's green insulation. Photo credit: Philip Hall/UAA

Marketing & Applications

Rhizoform's technology meets the industry's need for environmentally friendly, durable, cost-effective, easy-to-install and maintain insulation for buildings, housing, roads, and infrastructure.

Future applications include:

- Underlayment for oil and gas pipeline foundations
- Road underlayment
- Backfill in road construction
- Wall and roof insulation
- Piping insulation
- Housings for wireless environmental sensors
- Biodegradable packaging
- Biodegradable insulated shipping containers

Potential clients include departments of transportation, construction companies, shipping companies, and extraction industries.

Advantages

- **Cost-competitive** with synthetic insulation systems.
- **Sustainable** - biodegradable at the end of the structure's lifecycle.
- **Does not create plastic pollution** and waste streams, unlike petroleum-based plastic foams.
- **Safe and Environmentally-friendly** – manufactured from fully-renewable sources with a fraction of the energy input required to produce conventional polymeric foams.
- **Provides green insulation** to the increasingly health and environmentally conscious global markets
- **Durable and stable** in the most challenging environments.
- **Versatile** – easily customized to meet required shape and R-value.

Technology

Patent Pending #62/288,156

Rhizoform's technology provides a fast-growing, rapidly-renewable, carbon-neutral, and safe material for a new generation of bioengineered foams. Our patent-pending technology produces biodegradable insulation materials by introducing biologically produced tubes into a structural scaffold. The 3-D scaffold is printed or stamped from forestry by-products. Then fungal rootlets are introduced. They form a dense matrix consisting of a mass of branching, chitinous tubes. The internal scaffold delivers nutritive media and structure to the fungal tubes as they rapidly grow and bind the scaffold. The composite is then incubated for several days and dried before application.

Our biomaterial can be designed to achieve precise R-values, mechanical properties, and to match the net shape of the surface to be insulated. Unlike petroleum-based plastic insulation, our product does not create plastic pollution and waste streams. It binds carbon and drastically reduces environmental footprint of construction.



Testing of pipe insulation.
Photo credit: Philip Hall/UAA



Maria D. White preparing samples
for incubation.
Photo credit: Philip Hall/UAA

About Rhizoform

Dr. Philippe Amstislavski was experimenting with biomaterials developed technology to produce thermally insulating biological foam, and teamed up with Dr. Zhaohui "Joey" Yang, a geotechnical engineer. Dr. Yang, knowing the challenges of insulating buildings and infrastructure from the extremes of the Alaskan winters, suggested testing the foams for their stability and thermal properties and they developed a prototype for carbon-neutral, and high-value insulation from local forestry by-products and fungal rootlets. With a grant from University of Alaska Anchorage, the idea that led to Rhizoform was born.

Rhizoform, LLC is a Seawolf Holdings Company and was formed in July 2016 by the Vice Provost of Research and Graduate Studies at UAA, Dr. Helena Wisniewski, with the faculty inventors Dr. Philippe Amstislavski, Associate Professor of Public Health and Dr. Zhaohui "Joey" Yang, Professor of Civil Engineering.

Business Model: *Fully develop an engineered system to manufacture ASTM-rated insulation board and other bio-insulation products locally, and license them for manufacture and marketing nationally and internationally.*

The business infrastructure for the commercialization of faculty and student research resides in the Office of Research and Graduate Studies under the oversight of the Vice Provost. This infrastructure includes Seawolf Holdings and Seawolf Venture Fund, which provides seed money for start-ups and has a world class Board of Directors consisting of CEOs, venture firm partners and entrepreneurs. Seawolf Venture Fund provides early stage investment in start-ups and is managed by a seasoned team of investment professionals.

Management Team

To achieve its mission, Rhizoform, LLC is assembling a team of experienced senior executives, leaders in technology industries and entrepreneurs.

Dr. Philippe Amstislavski is Associate Professor in the Department of Health Sciences at the University of Alaska Anchorage and a Co-founder and chief executive officer of Rhizoform. Dr. Amstislavski is Associate Professor of Public Health at the University of Alaska Anchorage. His work centers on the nexus of Circumpolar public and environmental health. He researches technologies to reduce environmental footprint of development in high-latitude regions. His innovation in biomaterials is at the core of Rhizoform's mission.

Dr. Amstislavski earned PhD from the Earth and Environmental Sciences at City University of New York and his Master's degree from Yale School of Forestry and Environmental Studies.

Dr. Joey Yang is the co-founder of Rhizoform Dr. Yang joined UAA as an Assistant Professor in May 2003. He is currently Professor of Civil Engineering, Associate Director of Alaska University Transportation Center, and Director for Geotechnical and Frozen Ground Engineering Research Laboratory. Dr. Yang's expertise is in geotechnical and earthquake engineering, and he has maintained an active research program with particular interests in cold regions-related issues since he joined UAA in 2003. He has published more than 50 peer-reviewed papers, including 20 journal articles. Dr. Yang has received research funding in geotechnical/ earthquake engineering and cold regions-related research from NSF EPSCoR, U.S. Geological Survey, U.S. Dept. of Interior, U.S. Dept. of Transportation via Alaska University Transportation Center, U.S. Dept. of Energy through Alaska Energy Authority, and State of Alaska Department of Transportation. He received his Ph.D. in Civil and Environmental Engineering from the University of California, Davis and his B.S. in Hydraulic Engineering from Chengdu University of Science and Technology.

Dr. Helena S. Wisniewski, FNAI, is the Vice Provost for University Research and Graduate Studies at the University of Alaska Anchorage. President of Seawolf Holdings, LLC - part of the commercialization infrastructure she created, and **Founding Director of the Arctic Domain Awareness Center**, a DHS Center of Excellence. Executive and leadership positions in industry, academia, and the federal government. A technological entrepreneur who has successfully launched and sold start-up companies, and raised their investment. Served as Vice President for University Research at Stevens Institute of Technology prior to UAA. Corporate experience includes CEO/ Chairman of Aurora Biometrics, a company that she founded, built the business, and sold; Vice President of the Titan Corporation; senior executive at the Lockheed Corporation. At DARPA created the first mathematics program, and prior to that served at the CIA. Served on public and private boards of directors including the Board of Greatbatch Inc., (GB:NYSE) that provides implantable medical devices and on its Audit and Technology Committees, and currently the Advisory Board of Landmark Ventures. In 2007, the Secretary of the Navy appointed her to the Naval Research Advisory Committee (NRAC). She earned a PhD in mathematics from the Graduate Center of CUNY. Received awards for outstanding leadership, entrepreneurship, and significant scientific contributions. Recently she was inducted as a Fellow of National Academy of Inventors, FNAI.

Investment Strategy: Initial investment of \$300,000 to complete testing and final development.

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